

ERIC Document Resume		See Instruction Sheet		DATE OF RESUME		DATE RECEIVED	
A. PUBLICATION DATA							
1. ERIC NUMBER ED002236		2. ORIGINATOR CONTROL NO(S). N.A.		3. IDENTIFICATION NO. 654		DO NOT WRITE IN SPACE BELOW	
4. AUTHOR(S): Bretz, Rudy						MICROFILM COPY AVAILABLE YES ☒ NO ☐	
5. TITLE OF DOCUMENT ABSTRACTED: One Man Production						COPYRIGHT GRANTED YES ☐ NO ☒	
6. PUBLICATION TITLE: N.A.						COPYRIGHT RELEASE FILED YES ☐ NO ☐	
7. EDITOR(S): N.A.				8. PLACE OF ORIGIN ORG. ST. N.A. CITY, STATE TELE. EXT. INST/LOC CODE		TYPE OF REPORT PROPOSAL ☐ IN-PROGRESS ☐ FINAL ☒ FOLLOW-UP ☐	
9. PUBLISHER OR SOURCE N.A.						OTHER ERIC REFERENCES:	
10. VOL. N.A.	11. PAGES N.A.	12. MO./YR. N.A.	13. TOTAL PP. 13			ERIC SATELLITE CODE	
B. INDEXING DATA							
14. SUBJECT AREA				15. TYPE OF ENDEAVOR Report			
16. INDEXING TERMS (8-12)							
educational television				television instruction			
instructional technology				audiovisual aids			
instructional television (ITV)				overhead TV camera			
cameraman							
17. ABSTRACT (MAX. 280 WORDS)							
A new method for educational television utilizes two cameras and one crew member. A studio-type camera, equipped with an electronic viewfinder, focus knob, flexible three-castor dolly, and zoom lens, follows the instructor and covers his actions and demonstrations. A second camera is fixed and unattended. It is a small industrial type camera without viewfinder or focus controls. This camera is positioned directly above the instructor's podium or demonstration table. Its value consists of its ability to combine all the functions of other visual aids. The instructor can use photographs or any other graphic materials. He can write and draw in normal writing and drawing size on a convenient horizontal surface in front of him. He can show objects and manipulate cutouts in the fashion of the flannelboard. He does not have to make slides or prepare visuals in any particular size for the television camera. A large picture can be shown in its entirety and then the zoom camera can pick up its details. The cameraman handles all the functions of audio and video operation; he makes sure that whatever the instructor shows, says, and does is clearly perceptible to the viewer. No studio or control room is required, since all controls are in the room; no rehearsals or additional studio lighting are necessary. Equipment costs range from \$5,130 to \$13,935. Since a variety of equipment is adaptable for this program, the total cost should fall closer to the minimum amount.							
ERIC No. 18. SOURCE OF ABSTRACT							
C. FUNDING DATA							
19. SUPPORTING ORGANIZATION				20. DIVISION OR DEPT.		21. CONTRACT NO.	
				22. TOTAL COST OF PROJECT		PROJECT NO.	
				23. DURATION OR PROJECT		U.S. Department of Health, Education, and Welfare Office of Education	

Rudy Bretz, UCLA.

INSTRUCTIONAL TECHNOLOGY - U.S.C.

654

ONE MAN PRODUCTION

Instructor, Two Cameras and Cameraman
Produce Better ITV

Rudy Bretz

E-107

Many ETV proponents have suggested in the past that educational television need not be bound to the conventions of commercial television - that the purposes of instructional TV are so different, the regular methods and techniques of production need not necessarily apply. A lot of abridged and simplified methods have been tried, but still the prevailing techniques of producing ETV are the now traditional methods of the commercial studio. This involves generally two cameras, two cameramen, usually a floor manager, and, if any extensive visuals are to be used, a production assistant to work the animations, change the cards, point to the right place on the map, etc. Sometimes two or more production assistants will be required for these purposes. In the control room there must be a director to coordinate all these elements, an audio operator and a video operator. Sometimes a switcher is also used. Maximum personnel: nine persons in addition to the lecturer.

Of course these jobs are often combined. The floor manager may do the work of a production assistant, or he may be eliminated entirely and the cameraman cue the performer instead. The director in the control room may perform several functions. At Los Angeles City College in a significant experiment in new technique, the cameramen are eliminated, and the switching function is given over to the teacher himself. One camera covers the chalkboard, a second

J0339

REPRINTED BY PERMISSION
U. S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN PRINTED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

the table easel, and a third the podium where the teacher stands to deliver the body of his lecture. The fourth camera is tripod mounted and equipped with a remote-controlled zoom lens, available for angle shots of desk-top demonstrations, etc. Sometimes the fourth camera will be specially mounted on a microscope or other device for a particular purpose, or it may be moved into the control room and set up as a film chain in the event films are to be used.

In the control room only one technician is used; he rides audio and video controls and, when a film is used, operates the film projector and chain which feeds the film into the circuit. He also operates the remote control zoom lens. Maximum personnel: one person in addition to the lecturer. This is a big jump from the traditional TV studio, and there are many combinations of functions to be found which fall between these limits. Los Angeles City College has reduced the crew requirements to an absolute minimum; additional fixed cameras are substituted for the usual number of crew members. With a crew man costing perhaps \$4000 a year and a camera amortizing around \$1000 and costing possibly \$2000 to maintain and operate, a camera for a crew man would seem to be favorable exchange. How do the instructors like the idea of doing their own switching? This seems to be the most successful part of the operation. It requires only that the instructor be aware of his studio monitor at all times. After all, he is doing a TV lecture and nothing that he does will be of any value

at all unless it is seen on the TV screen. Once the instructor has learned to be aware of and take responsibility for what the camera is showing, it is only natural that he be given switching control.

What is lacking in the Los Angeles City College method is a flexible camera pickup on a variety of visuals. The camera on the easel and the one on the chalkboard are fixed in direction and field of view, the whole chalkboard is shown and the instructor must keep his writing above a certain size if it is to be legible.

The method proposed in this article utilizes only two cameras, and one crew member. I believe it to be superior to the Los Angeles City College method in effectiveness and in economy. The results of our first applications of it at UCLA lead us to consider it more effective than the traditional full treatment TV studio production for most instructional television. These are extravagant claims; they cannot be substantiated because the method has not yet been given a thorough test. But it would appear that in the production and presentation of the simple lecture-demonstration, where only one performer is involved and limited studio space is used, (a type of production incidentally which may account for a good 90% of educational and instructional television as it is being done today) at least in this area it is possible that the new method will turn out to be "the answer."

In the new method the two cameras are set up as follows: The first camera is operated by a cameraman. It is of the studio type, equipped with a good electronic viewfinder, a camera focus knob, and may also have a turret for more than one lens, although

this is not at all important. It will be equipped with a flexible three-castor dolly with wheels of over three inches in diameter. It may also have a method of easy adjustment for camera height, although this too is not strictly necessary. It will also be equipped with a zoom lens for alternate use when dollying is not practical. This will be a lens of the manual type with an adaptation for lens-focus control from the back of the camera. The purposes of this camera will be (1) following the instructor and covering his actions wherever he may want to go, (2) covering in closer shot any large demonstrations he may wish to do, table-top demonstrations, large visuals and the like.

The second camera is fixed and unattended. It is a small camera of the industrial type without viewfinder or focus controls. It has no pan or tilt adjustments. It is positioned directly above the instructor's podium or demonstration table. This is called the "Overhead TV" camera. It is equipped with a zoom lens, which is controlled by the instructor. Attached to the podium is a small switch with a simple knob or toggle movement, with which the instructor can select either the overhead or the studio camera. A master monitor, attached to the studio camera, will always show the instructor what his students are viewing. In some cases a second master monitor may be placed at some convenient location. It is important that these be master monitors, so the instructor is constantly reminded of what is actually on the line.

The extraordinary value of the overhead TV camera must be described at this point. This is the key to the proposed method

and must be seen in operation to be actually appreciated. It is not only an improvement over all the commonly used types of classroom visual aids (except film) but combines the functions of them all. Another extravagant claim. But consider the advantages: you can use photographs, or any other graphic materials, you can write and draw in normal writing and drawing size on a convenient horizontal surface in front of you, you can show objects and manipulate cut-outs in the fashion of the flannelboard. You don't need to make up slides, or prepare visuals in any particular size for the TV camera. Because a zoom lens is in use, you can use pictures in a wide range of sizes. A useful range is from a width of 12 inches down to a width of $2\frac{1}{2}$ inches. Even more important than this, you can show a large picture in its entirety and then zoom in for the analysis of detail, returning for re-establishment at any time. "Panning and tilting" movements are achieved by sliding the picture underneath the camera. The lecturer can point to portions of the picture with his finger, or if he is zoomed in so close that the finger is gigantic on the screen, a pencil can be used.

The overhead TV camera as a visual aid has been in use at UCLA for less than a year, at the time of this writing. We have had about fifteen people make use of it in presenting instructional materials. A training period of about ten minutes suffices at the start, to learn the coordination involved and the range of possibilities in using the overhead camera. When the viewfinder camera and switch are added it takes about an hour for the average

person to learn the coordination required. With increased use, naturally, anyone will exhibit steadily greater effectiveness.

One of the most practical aspects of this production method is that rehearsal for purposes of coordination is eliminated. It may still be necessary for the instructor to try out a new demonstration on camera to determine the best background, the best weight of pencil to use, the best angle at which to hold an object, but this is reduced to an absolute minimum, since the instructor is actually watching all this at the time he gives the lecture, and can make his final improvements at that time. But when more than one person must coordinate between the functions of talking about a thing and manipulating it, then coordination rehearsal is necessary. Very little of the time involved in most conventional TV rehearsals constitutes rehearsal for the performer. Most of the time is really rehearsal for the studio crew.

The cameraman, being the only crew member involved, must then handle the functions of audio and video operation as well. Since in this type of production a lavaliere microphone is used, the audio need only be set to a pre-determined level and left there. In the rare event that special audio effects are part of the lecture presentation and a second microphone must be used, it is easily possible that the cameraman could still handle the sound mixing if a small sound console is placed somewhere below the camera on the same dolly. A type of camera chain is used on which the important video adjustments; beam, gain, etc., appear on the camera. As for the second camera, industrial cameras are

now being made with many features which simplify video operation, and it is not necessary for an operator to ride video on the overhead camera once the proper adjustment has been made.

In our own application the method has particular appeal because it does not require a studio and control room. All controls are necessarily in the room with the instructor, so a control room is not needed, and since vidicon tubes are now practically the equal of the conventional image orthicon in sensitivity (a point which has not been publicized very much) no special additional studio lighting is required. A well-lighted classroom and lenses which will open up to f2.8 or beyond is all that is needed. Naturally we don't have key, fill, and back light with all the sparkle of a network TV production, but we have a good clear picture which makes the classroom look like a classroom, and we can see all the visuals the instructor uses and hear everything he says. More than this would be theater art - of great value in general-interest ETV broadcasting, but not necessarily needed for effective teaching.

Imagine yourself now, if you will, an instructor of a future course in, say, anthropology, the lectures of which are being given via TV. You have prepared your lecture and wish to use a number of visual aids.

To begin with you will need a map, since you are talking about American prehistory and will need to locate the sites where definite dates have been established. You want to associate the dates with the sites. Then you want to use a published report of the excavation at one of the local sites, containing pictures of the burials which were uncovered. At this point you will need

to draw a diagram to show the difference in burial methods which distinguish early and later cultures. Finally you have several actual artifacts, each smaller than the palm of your hand, which indicate the development of stone chipping techniques. Bringing this armload of books, photos, objects, etc. you arrive at the classroom where you will deliver the lecture.

You stand at the podium and try these all out on the overhead camera, experimenting with the best background for the artifacts, finally deciding to simply hold them in the palm of one hand while turning them with the other. You check your photographs to see if the important detail can be seen. You tape your outline down to the top of the podium, off to the side where it will not be covered with the visuals you are using, yet close enough for ready reference. You check the large built-in stop watch which reads in terms of minutes remaining, and set it for the fifty minutes your lecture is to run. The cameraman gives you the cue to start.

On the monitor attached to the camera in front of you, you see a smiling face. If it isn't smiling you contrive to make it so. You imagine you are addressing the last class you taught--after you got to know them a little and you felt you could relax and sit on the front of the demonstration table. You leave the podium and walk around in front where you do sit on the front of the table. The viewfinder camera follows you around, pulls back

a little as you approach, and then steadies as you sit. You observe your position, half sitting with your arms folded. Not bad. But now you have to refer to your map, and write out a couple of new words. You don't go to the wall behind you, as you might if you were in a conventional classroom, or TV studio for that matter, you go to your podium where the overhead TV camera is in readiness. Explaining what you are doing you unfold the map and lay it out on the podium. The transmitted picture now includes the overhead camera and you are seen as you reach for the switch to put it on the line. Then the monitor on the camera in front of you shows a map. It is the wrong area of the map, and everything is much too small to be seen, but you move the map around until the proper area is in the center and feeling under the table with your foot you find the double acting pedal (something like the old pump organ pedal) and pushing it forward, you zoom the lens in to a closer shot. You want to emphasize certain features on the map by drawing over them with a heavy pencil. But this is a library map, and you mustn't deface it. A sheet of frosted acetate is handy, and you simply lay this over the area and draw in freely whatever features you wish. Now you are finished with the map and you take it away. Suddenly the monitor you have been watching shows a close-up of the wood grain of the podium. You reach for the camera switch and see a waist shot of yourself replace the empty screen. After making a couple of points purely verbally, you need to show some diagrams and photographs from the archeological survey report you have brought with you. The report is on the feeding table to the right of the

podium, (the map has already found its way to the receiving table at the left) and there are two or three page markers sticking out of the edge of the volume. You open it to one of these and lay it open on the podium. A touch of the switch and you are looking at an extreme close-up of a very small portion of text. So great is the enlargement, with the lens left in the zoomed-in position, that you can actually read the type, although only a portion of a full type line can be seen. Heel pressure this time on the pedal and the lens zooms slowly out to show the entire book. You leaf back to the title page, zoom in again on the author's name, push the book away from you so it slides up the the screen and the date becomes visible at the bottom of the page, then zoom back again as you turn to the page you wish to show.

You need to refer again to the map with which you began, and you simply put it once more under the camera and adjust the zoom lens. You want, at this point, to show the artifacts you have brought, so you place a hammerstone under the camera. Zoomed up full, it more than fills the screen and you watch the monitor as you turn it in such a way that the shape of the flaking is most visible.

The above narrative describes a presentation which falls short of being "slick and professional;" there are moments when there is nothing on the screen, or what is there is too large or too small to have meaning. An instructor quickly learns, however, to zoom his overhead camera wide or to switch to the front camera, before he changes materials. But it is important

to note how very little these momentary production crudities affect the function of instruction. We have seen instructors operate most effectively the first time they have used the equipment. This is the area where traditional TV thinking keeps us from trying anything simple enough. We are afraid of production crudities. We hesitate to dolly the camera if the floor is bumpy, and fail to show close-ups of essential visuals. We wait for the speaker to end a sentence so we can cut on a phrase, and leave the wrong shot on the screen until we do. It hardly seems possible that TV, that newborn medium about which a lot of people are still saying "it's in its formative stages", "it's so new there aren't any experts", is really an old man of twenty-one now, kind of set in his ways - ways which haven't changed too much since the first few years - ways which were developed for the play-illusion, presentational, entertainment production.

Practical aspects

The fact that the overhead TV camera I describe can be one of the industrial models without viewfinder makes this second camera most inexpensive. In the cost list which follows maximum and minimum figures have been suggested. A variety of equipment is adaptable for the purpose, and a school might decide in terms of a more expensive item in one category and a less expensive item in another. It is most likely, however, that whatever total cost is arrived at, it will not only lie between the extremes shown, but will fall considerably closer to 5,000 than 14,000.

Basic essentials:

	<u>Minimum</u>	<u>Maximum</u>
Viewfinder TV camera	\$ 3,000	\$ 7,500
*Tripod and dolly	250	500
*One-inch lens	50	75
**Eight-inch monitor	100	350
***Mounting for camera	30	60
Overhead TV camera	1,200	3,000
*Zoom lens (manual or remote-controlled)	400	2,000
Foot control (for remote-controlled zoom lens)	---	50
Switch	50	100
*Stand for overhead TV camera	50	300
Total	\$5,130	\$13,935

Desirable additions:

*Zoom lens for viewfinder camera	400	400
*Light pedestal to replace tripod and dolly	Add: 300	---
*Six-inch lens for large close-ups with viewfinder camera	100	100
*Portable lights (4 R-40's)	60	100
Total	\$5,990	\$14,535

*Astute shopping for used equipment will easily reduce these items by about 50 per cent. Of course, appreciable savings can be made in all the items that are bought on the second hand market.

**See NAEB Journal, March 1960, p. 35.

Figure 1 is a diagram of the wires and cables necessary for the proposed TV production method. The cameraman is called "TV Specialist" because he has many other functions. He will (1) haul the equipment to the specified classroom, (2) set it all up and get a picture, (3) make video and audio adjustments when necessary, (4) operate camera, (5) break down equipment, (6) haul to next location. He will take responsibility for a satisfactory communication. It is his job to see that whatever the instructor shows, says, and does is clearly perceptible to the viewer. To this end he is equipped with a headset over which he can hear from some selected member of the audience (anyone, really) as to how it is all coming across.

